

# VALIDATING TECHNICAL SOLUTIONS BY MEANS OF R&D TESTING

Introducing a new assembly or sub-assembly (infrastructure, rolling stock, etc.) into an existing railway system is never easy. Numerous parameters are involved and these can have a major effect on the behaviour of the solution proposed. A suitable compromise therefore has to be found. It is at this point that tests are essential to identify the right technical trade-offs before the start of series manufacture, to minimise the risks.



## R&D TESTING IN PRACTICE

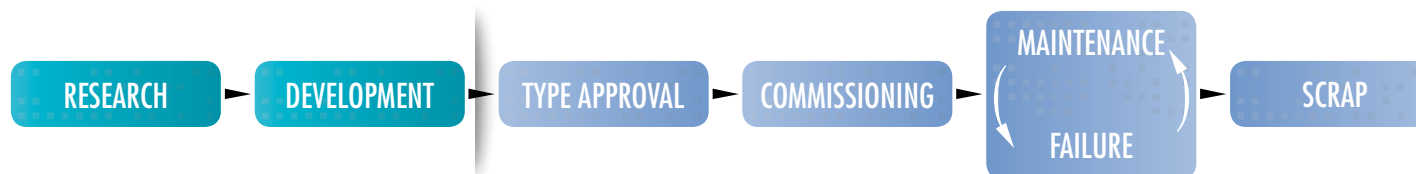
**We can assist you on a day-to-day basis in...**

- Deciding on the content of your test programme.
- Making specific proposals for expert appraisals and tests when making the final adjustments to your sub-assemblies.
- Optimising your test programme in real time in association with your project team.
- Offering you our expert knowledge during the results analysis phase.

## OUR ADDED VALUE

**In the R&D sector, Eurailtest offers...**

- The proven experience of a railway operator in choosing the right technical options.
- Unequaled access to the human and material resources of SNCF and RATP and those of the French and European networks.
- A network of experts in all technical fields.
- A single partner to help you in preparing and implementing your projects.



Eurailtest can play a part at each stage of your product life cycle.



*During Operation V150<sup>(1)</sup>, I had the pleasure of working with a remarkable, highly professional team.*

**François Lacôte**, Alstom Transport

(1) World rail speed record.

## VALIDATING TECHNICAL SOLUTIONS BY MEANS OF R&D TESTING



- Tailor-made test programmes and resources enabling you to validate your products prior to their industrial production.
- The opportunity to test the behaviour of your assemblies or sub-assemblies under actual working conditions, so

you can validate your digital models on the basis of the data obtained.

- The ability to create the conditions conducive to the success of your project, in particular for the later type approval phase.

### CLIENTS INCLUDE

- **ALSTOM TRANSPORT:** tests to finalise the AGV prototype – Dynamic behaviour tests during the final adjustments to CITADIS trams on European networks (Rome, Turin, Dublin).
- **RFF:** tests to calibrate the ERTMS system on the East European high-speed line.
- **ERMEWA:** experimental crash tests to complete the development of anti-climbing devices for tank wagons.
- **SIEMENS TRANSPORT SYSTEM:** functional tests and validation of safety software for the automatic metro systems in Barcelona and Algiers.

### KEY FIGURES

## 574.8 km/h

The know-how of the EIG member laboratories made the new world rail speed record possible.

## 1 80 km

 of high-speed line transformed into a test bed for the AGV prototype.

## 70,000

 hours spent on R&D projects in 2008.

### EURAILTEST IN BRIEF

An EIG set up to market the services and skills of the SNCF and RATP laboratories.

Consultancy, engineering and tests.

Ability to offer services for both light and regular rail systems.

Cutting edge skills backed by operating experience

More than 400 railway testing experts and engineers.

Access to the human and technical resources of SNCF and RATP.

Tailor-made packages.

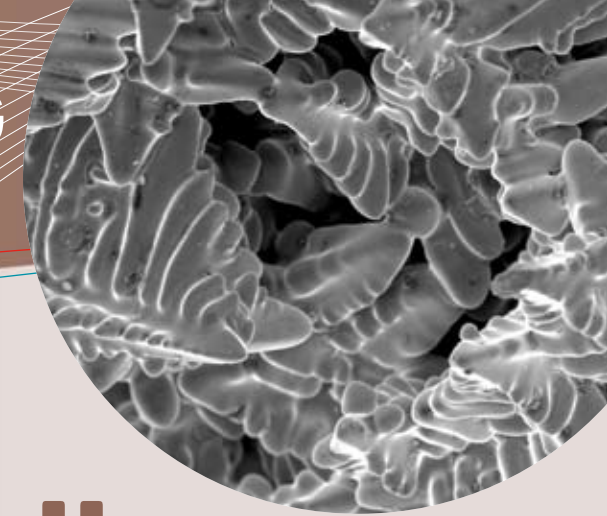
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# ENGINEERING AND TESTS AT THE SERVICE OF YOUR ROLLING STOCK OR INFRASTRUCTURE MAINTENANCE



Safety, reliability, availability and optimisation costs of ownership are some of the basic elements guaranteed by proper maintenance of your railway system or components, making maintenance one of your key performance factors. Any malfunctions must be corrected as soon as possible, at reasonable cost, to keep their effect on operations to a minimum and protect your business model. Our skills and abilities are a major asset in identifying the causes of such failures and carrying out tests to confirm the validity of the remedies proposed.

## MAINTENANCE IN PRACTICE

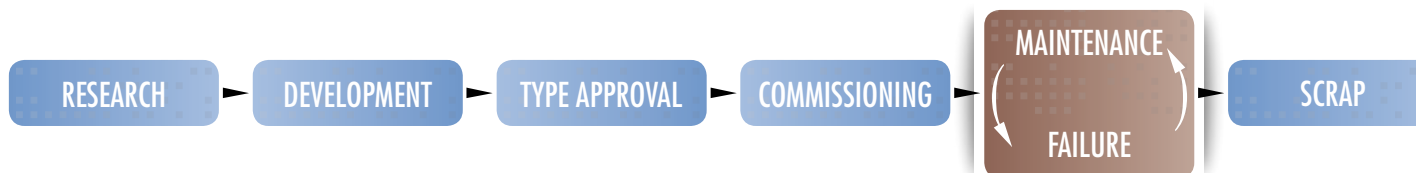
### We can assist you on a day-to-day basis in...

- Proposing solutions to drive down your costs of ownership.
- Offering sophisticated measuring systems to optimise your infrastructure maintenance (track, signalling, OHL and electrical power supply facilities).
- Identifying the typical behaviour of parts or sub-assemblies in service.
- Analysing the causes of failures or malfunctions, suggesting and confirming solutions.
- Assessing whether the production output of your maintenance facilities is sufficient by means of targeted audits.

## OUR ADDED VALUE

### In the maintenance sector, Eurailtest offers...

- Skills and competencies reinforced by operating experience.
- Proven fault analysis methods for a 100 % guaranteed result.
- Constant feedback as input for enhancing technical solutions.
- Access to a wide range of resources enabling us to cater to all your problems whatever your particular constraints.



Eurailtest can play a part at each stage of your product life cycle.



*We commissioned Eurailtest to record track geometry and carry out ultrasonic tests on metro lines. We were very satisfied with the team, its competence and responsiveness. Our contacts with them were good.*

**Jacques Goffin**, STIB



*Sound experience of non-destructive ultrasonic testing. A competent and responsive partner.*

**Laurent Daniel**, Alstom Transport



### CLIENTS INCLUDE

- **STIB:** on site measurements of metro and tram return traction currents and identification of the characteristics of different track circuits in the laboratory to ascertain their compatibility with the return traction currents measured, track geometry recording and ultrasonic testing on metro lines in Brussels.
- **RFF:** identification of the performance characteristics of the return traction current circuits, detection of defects in the OHL using thermal imaging techniques.
- **Other examples:** failure analysis following the appearance of cracks in a locomotive wheel; measurement of service loads on the ball-and-socket joint between the vehicle bodies of trams in Rome and fatigue behaviour analysis; optimisation of ultrasonic testing methods for detecting defects at the toe of bogie welds.

### KEY FIGURES

**70** years of experience in maintenance engineering operations.

**50** fixed workstation test benches.

**25** independent measuring chains to judge the behaviour of components and sub-assemblies in service.

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# TYPE APPROVAL AND COMMISSIONING AT THE SERVICE OF YOUR ROLLING STOCK OR INFRASTRUCTURE

Before your infrastructure or rolling stock can be commissioned in France or elsewhere in Europe, it is necessary to demonstrate its conformity with the standards and regulations in force. Our experts are past masters in the complex type approval process and their skills are a vital asset in the success of your venture.

## TYPE APPROVAL IN PRACTICE

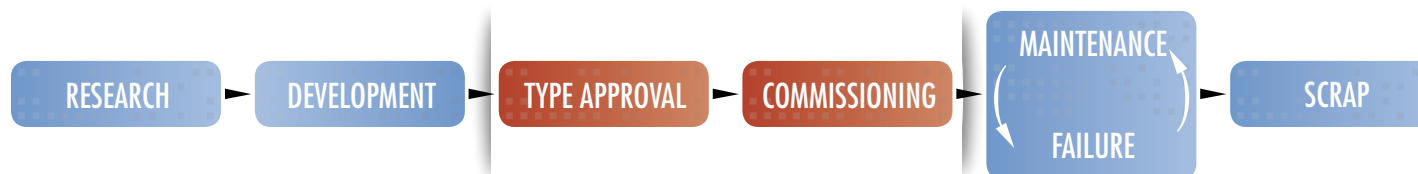
**We can assist you on a day-to-day basis in...**

- Finding your way round the complicated and restrictive world of regulations.
- Helping you come to grips with the type approval process.
- Selecting and carrying out the tests required.
- Producing the documents necessary for the type approval tests and offering you the appropriate expert opinions.
- Confirming the conformity of series production in relation to the reference type

## OUR ADDED VALUE

**In the type approval sector, Eurailtest offers...**

- Familiarity with existing and emerging standards and regulations.
- Acknowledged practical experience of type approval on a European scale.
- A single contact for complete type approval in France and the rest of Europe.



Eurailtest can play a part at each stage of your product life cycle.



*The tests performed by Eurailtest ran very smoothly. Everything went to schedule and team availability was good. STADLER and CFF management are satisfied with the work done.*

**Gerd Maier**, STADLER



*EURAILTEST carried out current collection tests for us in Belgium. The team conformed to our requirements. We are very satisfied with our choice of partner.*

**Simon Fischer**, SIEMENS

## TYPE APPROVAL AND COMMISSIONING AT THE SERVICE OF YOUR ROLLING STOCK OR INFRASTRUCTURE



### CLIENTS INCLUDE

- **SIEMENS:** type tests in Belgium on HLE18 locomotives.
- **INFRA SPEED:** commissioning tests on the HSL-Zuid high-speed line.
- **STADLER:** type tests on FLIRT France trainsets.
- **DB AG:** type tests in France and Belgium on ICE3 trainsets.
- **BOMBARDIER TRANSPORT:** type tests on the FRANCILIEN.
- **Engineering Support Group /Euro Cargo Rail:** type tests in France on Class 66 and Class 77 locomotives.
- **China South Railway:** type tests on «metro» and «high speed» bogies.
- **Engineering Support Group /AXIOM RAIL:** type tests on the TF25 bogie in France and Germany.
- **Trans Euro Pyrenees:** commissioning tests on the high-speed line between Perpignan and Figueras.
- **Other example:** tests in conjunction with the commissioning of high-speed lines in France (LN1 to LN6), Belgium (L1 to L4), and the UK (HS1).

### KEY FIGURES

**4** continents on which Eurailtest has performed tests and/or expert appraisals.

**1.6 MILLION KM** covered in 2008 by Eurailtest test trains for rolling stock and infrastructure type approval purposes.

**73** tests awarded EN ISO 17025 accreditation by COFRAC.

**2,320 KM** of high-speed line commissioned with Eurailtest test teams.

**5,000** sensors used in the Eurailtest laboratories.

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# CONTAINING THE ENVIRONMENTAL IMPACT OF YOUR ROLLING STOCK OR INFRASTRUCTURE

The impact of rolling stock and infrastructure on the environment is not always easy to establish or even identify. Such impact may be more or less critical depending on the amount of interference it creates in railway or other adjacent facilities, noise, smoke, etc.

Our experts can help you to ensure that the vehicles and equipment you have selected fulfil the health, safety and environmental conditions imposed by the regulations currently in force.

## THE ENVIRONMENT IN PRACTICE

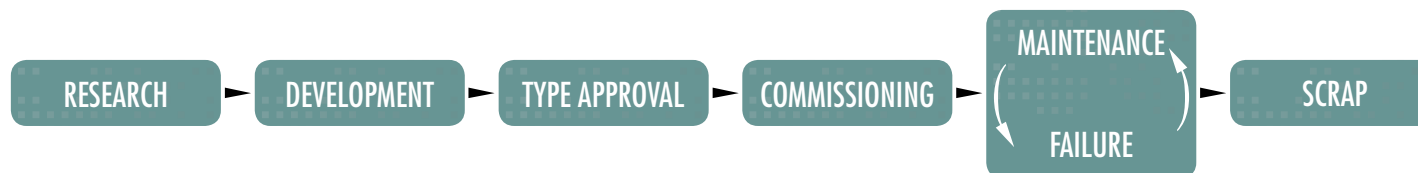
### We can assist you on a day-to-day basis in...

- Checking to ensure your equipment meets existing and emerging European standards.
- Establishing the typical impact of your facilities and rolling stock on their immediate environment and evaluating the corresponding risks.
- Helping you identify the risks created by railway facilities and suggesting solutions.
- Making improvements in the interests of local residents, users and staff.

## OUR ADDED VALUE

### In the environment sector, Eurailtest offers...

- Appropriate advice and recommendations based on its experience of light and regular railway operations.
- Skilled experts to assist you in carrying out impact studies (modelling and simulation) in the early stages of your projects.
- The facilities needed to enable tests to be carried out under real conditions.
- The ability to participate in the design phase and help you adapt your products via type approval procedures.



Eurailtest can play a part at each stage of your product life cycle.



*Eurailtest gave us the full benefit of its technical knowledge during our ground/rail electrical insulation tests* ““

**Laurent Feuillu**, Colas Rail



## CLIENTS INCLUDE

- **Colas Rail, Prefarail, CDM...:** identifying the characteristics of the electrical insulation between ground and rail in the case of prefabricated tram infrastructure (renovation of the track bed of the T1 tram line and extension of T2 in Paris).
- **SCLE Toulouse:** mechanical vibration and impact tests on SNCF public address equipment.
- **French Ministry of the Interior:** identification of the characteristic behaviour of Taser pistols in a railway environment.
- **RFF:** noise measurements on passing trains on the Lyons/Valence section of the high-speed line.
- **Stations, airports:** tests and test engineering in connection with calculation of the heat discharged by ticket vending machines.
- **COMPIN:** seat cover smoke/fire classification.

## KEY FIGURES

**85** smoke/fire tests in 2008.

**50** COFRAC microphones in accordance with the EN ISO 17025 standard.

**12 MVA** of electrical power installed in our test sub-station for 25 kV single phase current and 5 MVA for 1,500 to 3,000 V d.c. current.

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# TRAINING IN RAILWAY TECHNOLOGIES



Irrespective of whether you are a newcomer to the world of railways or a seasoned railway professional, we can offer you a whole series of training courses on a wide-range of topics such as running dynamics, brakes, welded assemblies, metrology, etc. To cater to the needs of our industry clients, our modules offer a combination of theory and practice.

## TRAINING IN PRACTICE

**We can assist you on a day-to-day basis in...**

- Perfecting your knowledge of the basic techniques fundamental to railway system operation.
- Helping you pinpoint and master the regulations and standards applicable to your particular technical field.
- Enabling you to identify any risks to the health and safety of staff working in a railway environment and offering you solutions for their protection.
- Helping you to understand the complex principles involved through practical application.

## OUR ADDED VALUE

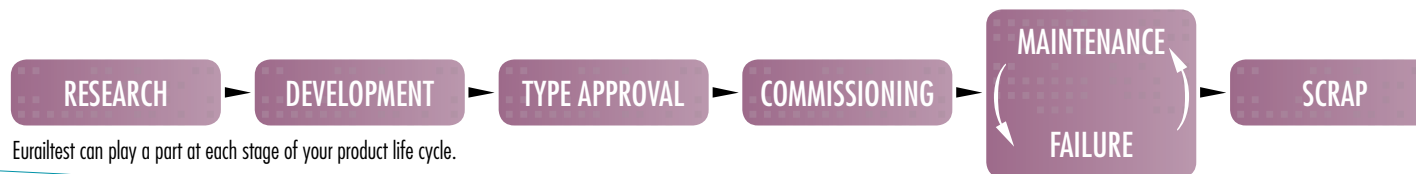
**In the training sector, Eurailtest is...**

- A vast network of trainers, highly qualified in the different railway sectors.
- Knowledge of the regulations and standards.
- A two-pronged theoretical and practical approach.
- Specific recommendations with regard to problems commonly encountered in the railway environment.
- A broad selection of potential publics: research engineers, maintenance technicians, members of the Staff Health and Safety Committee, etc.
- Course content consistently updated and enhanced from grassroots feedback.
- Extensive course content in three different areas (engineering, operations and maintenance).
- Choice between training in our laboratories or on your premises.



*I attended a one-day course on «Running gear and lubrication». From the highly practical training dispensed, I learned more about the foreign bodies found in lubricants. This knowledge is extremely useful to me in my everyday work.*

**M. Gangarossa**, Lormafer



Eurailtest can play a part at each stage of your product life cycle.

## OUR TRAINING MODULES

### ■ RAILWAY TECHNOLOGIES

With their focus on the fundamentals of the railway system and the corresponding technologies, these modules are designed to enable trainees to understand the causes of the different phenomena and analyse the potential consequences of a particular technological choice.

#### Topics offered

- Running dynamics.
- Braking.
- Railway noise
- Rolling stock fire safety.
- etc.

### ■ HEALTH AND SAFETY AND WORK

- Noise and vibrations at the workplace: from theory to practice, everything you need to know about acoustics and noise level measurements.
- Asbestos-related risks.
- etc.

### ■ MEASURING TECHNIQUES

- Metrology: gauging and inspection for metrological experts, optimisation of the life cycles of equipment for fleet managers: this course is an introduction to metrology and has given excellent results in practice.
- etc.

### ■ MAINTENANCE TECHNIQUES

Specifically for maintenance experts, the teaching dispensed in this module should develop their knowledge and give them a greater command of the different techniques required for their work.

#### Topics offered

- Bolted assemblies.
- Welded assemblies.
- Track geometry.
- Raising the OHL.
- Running gear and lubrication.
- etc.

## KEY FIGURES

**40** training courses in 2008. | **500** trainees in 2008.

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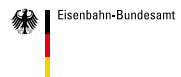
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